

Claims

We Claim:

1. A method of improving an asphalt composition comprising adding to an asphalt a synthetic flux oil, where the synthetic flux oil comprises at least one asphaltite and a carrier oil comprising a hydrocarbon selected from the group consisting of naphthenic or paraffinic oils, to give a modified asphalt.
2. The method of claim 1 where the asphaltite is gilsonite.
3. The method of claim 1 where the carrier oil comprises a paraffinic oil having little or no naphthenic content.
4. The method of claim 1 where the carrier oil is pumpable at normal processing temperatures between ambient and 400°F (204°C) and has a flash point of about 450°F (about 232°C) or higher.
5. The method of claim 1 where the asphaltite comprises between about 20 and about 30 percent by weight of a total weight of said synthetic flux oil.
6. The method of claim 1 further comprising producing the flux oil by mixing the asphaltite into the carrier oil while heating and stirring at a temperature between about 200 and about 400°F (about 93 and about 204°C) for a period of time sufficient to dissolve substantially all of the asphaltite into the carrier oil.
7. The method of claim 1 further comprising producing the flux oil by mixing the asphaltite into the carrier oil in the absence of added heat.

8. The method of claim 1 where the synthetic flux oil comprises a sufficient amount of asphaltites to provide temperature spread of the modified asphalt of at least about 90°C between the maximum and minimum temperatures of the MP1 binder specification.
9. An asphalt composition comprising an asphalt and a synthetic flux oil, where the synthetic flux oil comprises at least one asphaltite and a carrier oil comprising a hydrocarbon selected from a naphthenic or paraffinic oil.
10. The asphalt composition of claim 9 where the asphaltite is gilsonite.
11. The asphalt composition of claim 9 where the carrier oil comprises between about 53 wt% and about 58 wt% nonpolar aromatics, between about 12 wt% and about 14% polar aromatics, and between about 27 wt% and about 34 wt% saturates.
12. The asphalt composition of claim 9 where the carrier oil is pumpable at temperatures between ambient and 400°F (204°C) and has a flash point of about 450°F (about 232°C) or higher.
13. The asphalt composition of claim 9 where the asphaltite comprises between about 20 and about 30 percent by weight of a total weight of said synthetic flux oil.
14. The asphalt composition of claim 9 where the asphalt composition is made by a process comprising
  - producing the flux oil by mixing the asphaltite into the carrier oil while heating and stirring at a temperature between about 200 and about

380°F (about 93 and about 193°C) for a period of time sufficient to dissolve substantially all of the asphaltite into the carrier oil; and adding the flux oil to the asphalt at a temperature between about 200 and about 380°F (about 93 and about 193°C).

15. The asphalt composition of claim 9 where the asphalt composition is made by a process comprising
  - producing the flux oil by mixing the asphaltite into the carrier oil in the absence of added heat; and
  - adding the flux oil to the asphalt at a temperature between about 200 and about 380°F (about 93 and about 193°C).
16. The asphalt composition of claim 9 where the synthetic flux oil comprises a sufficient amount of asphaltites to provide temperature spread of at least about 90°C between the maximum and minimum temperatures of the MP1 binder specification.
17. The asphalt composition as recited in claim 10 further comprising a thermoplastic elastomeric polymer in an amount of about 1 to about 6 wt% to produce a polymer modified asphalt (PMA) having a compatibility test value (difference between top and bottom softening points) of 20°C or less.
18. A synthetic flux oil comprising at least one asphaltite and a carrier oil, where the carrier oil comprises a hydrocarbon selected from the group consisting of naphthenic or paraffinic oils, and where the asphaltite comprises between about 20 and 30 weight percent of the total weight of said synthetic flux oil.
19. The synthetic flux oil of claim 18 where the asphaltite is gilsonite.

20. The synthetic flux oil of claim 18 where the carrier oil comprises between about 53 wt% and about 58 wt% nonpolar aromatics, between about 12 wt% and about 14% polar aromatics, and between about 27 wt% and about 34 wt% saturates.
21. The synthetic flux oil of claim 18 where the carrier oil is pumpable at temperatures between ambient and 400°F (204°C) and has a flash point of about 450°F (about 232°C) or higher.
22. The synthetic flux oil of claim 18 made by the process comprising mixing the asphaltite into the carrier oil while heating and stirring at a temperature between about 200 and about 380°F (about 93 and about 193°C) for a period of time sufficient to dissolve substantially all of the asphaltite into the carrier oil.
23. The synthetic flux oil of claim 18 made by the process comprising mixing the asphaltite into the carrier oil in the absence of added heat.
24. The synthetic flux oil of claim 18 where the synthetic flux oil comprises a sufficient amount of asphaltites to provide temperature spread of at least about 90°C between the maximum and minimum temperatures of the MP1 binder specification.
25. The synthetic flux oil of claim 18 wherein said synthetic flux oil comprises a sufficient amount of asphaltites to provide a initial viscosity at about 140°F (about 60°C) between about 1000 and about 1600 poise (1 to 16 Pa-s).
26. A road made from an asphalt composition comprising an asphalt and a synthetic flux oil, where the synthetic flux oil comprises at least one asphaltite and a carrier oil comprising a hydrocarbon selected from a naphthenic or paraffinic oil.

27. A method of road building comprising adding to an asphalt a synthetic flux oil, where the synthetic flux oil comprises at least one asphaltite and a carrier oil comprising a hydrocarbon selected from the group consisting of naphthenic or paraffinic oils, to give a modified asphalt, combining the modified asphalt with aggregate to form a road paving material, and using the material to form road pavement.